

Regulations Adopting & Amending Certain Standards
of the National Fire Code Regarding Fire Protection Systems

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Department of Fire and Rescue Services

Montgomery County Regulation on:

FIRE SAFETY CODE - FIRE PROTECTION SYSTEMS
DEPARTMENT OF FIRE AND RESCUE SERVICES

Issued by: County Executive
Regulation No: 10-97

Authority: Code Section 22-13
Supersedes: Executive Regulation 19-94
Council Review: Method 2 under Code Section 2A-15
Register Vol. 14, Issue 4
Effective date: September 29, 1997
Sunset date: None

SUMMARY: The proposed regulation adopts, amends, and/or updates certain editions of the National Fire Codes and Standards related to fire protection systems. This regulation applies to all buildings and structures within Montgomery County's jurisdiction.

ADDRESSES: Deputy Chief LeRoy R. Oettinger, Fire Marshal, Department of Fire and Rescue Services, Executive Office Building, 101 Monroe Street, Rockville, Maryland 20850

STAFF: For further information, contact Deputy Chief LeRoy R. Oettinger, Fire Marshal, Department of Fire and Rescue Services, 301-217-2441.

BACKGROUND: This regulation supersedes Executive Regulation 19-94. Its purpose is to adopt currently published standards of the National Fire Codes and amend them to be consistent with Maryland and Montgomery County laws.

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- Sec. 1.** In accordance with the procedures authorized in Chapter 22, "Fire Safety Code", of the Montgomery County Code, 1994, the following Executive Regulation shall apply to the design, installation, and maintenance of fire protection systems in buildings or structures. It supersedes Executive Regulation 19-94, dated April 11, 1995. Where there are differences between this regulation and the Montgomery County Building Code, this regulation must not be construed to preempt or negate any more restrictive provisions of that code.
- Sec. 2.** Unless otherwise noted, all references to the National Fire Codes and standards adopted in these regulations are to those codes, standards, recommended practices, and manuals in the National Fire Codes, published annually by the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269. The references to these National Fire Codes and Standards are set forth in Section 22-14 of the Montgomery County Code, 1994.
- Sec. 3.** Fire Protection System Permit. A permit must be obtained from the director to install or modify any fire protection system, except fire sprinkler, standpipe, fire pump, fire alarm, fire detection, Halon, carbon dioxide, clean agent or smoke control systems.
- Sec. 4.** Sprinkler License. A contractor or person responsible for the installation or modification of a sprinkler system or any portion thereof in Montgomery County, must obtain a license from the director subject to the following criteria:
- (a) Qualifications required.
 - (1) Residential license (13D and 13R sprinkler systems): National Institute for Certification of Engineering Technologies (NICET) Level II Certification, Registered Professional Engineer Certification, or other nationally recognized certification as approved by the director.
 - (2) General license (all sprinkler systems): National Institute for Certification of Engineering Technologies (NICET) Level III Certification, Registered Professional Engineer Certification, or other nationally recognized certification as approved by the director.
 - (b) Proof of financial stability.
 - (c) Licenses will be subject to annual renewal.
 - (d) The director shall have the power to rescind these licenses for good cause.
 - (e) The fee for each license shall be \$25.00.

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Sec. 5. Maintenance of Residential Sprinkler Systems. All leases shall have the following provision: "Sprinkler System. In units equipped with fire sprinkler systems, no portion of the system is permitted to be changed, altered or tampered with. Sprinkler heads must not be painted, covered, or obstructed, nor must any item be hung from them. Prior to any alteration to the sprinkler system or any changes/additions/removal of partitions/walls, plans must be submitted to the Fire and Rescue Services for approval of these modifications".

Sec. 6. Smoke Control System shop drawing submittals shall include:

- a. Plans and specifications
- b. Engineering calculations and/or computer model
- c. Floor plans
- d. System diagrams and details
- e. Sequence of operations and control layout
- f. Preliminary test procedures
- g. Acceptance test procedures
- h. Pass/fail criteria

Sec. 7. Standards adopted. The following standards published by the National Fire Protection Association, International, Batterymarch Park, Quincy, Massachusetts 02260, are adopted in their entirety in these regulations, except as otherwise amended. The text of these adopted standards are fully enforceable as other regulations adopted under the provisions of Chapter 22 of the Montgomery County Code, 1994, as if they were incorporated and printed in their entirety. The dates of editions of the individual codes and standards are as listed in each section. The standards adopted pursuant to these regulations do not waive any provision of Chapter 22, nor are they less restrictive than its provisions.

<u>NFPA No.</u>	<u>Code or Standard</u>
11	Standard for Low Expansion Foam & Combined Agent Systems (1994)
11A	Standard for Medium & Low Expansion Foam Systems (1994)
12	Standard on Carbon Dioxide Extinguishing Systems (1993)
12A	Standard on Halon 1301 Extinguishing Systems (1992)
12B	Standard on Halon 1211 Extinguishing Systems (1990)
13	Standard for the Installation of Sprinkler Systems (1996)
13D	Standard for the Installation of Sprinkler Systems in One and Two-Family Dwellings and Mobile Homes (1996)

13R Standard for the Installation of Sprinkler Systems in
Residential Occupancies up to four (4) stories in
height (1996)

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14 Standard for the Installation of Standpipe and Hose
Systems (1996)
15 Standard for Water Spray Fixed Systems (1996)
16 Standard for Deluge Foam Water Sprinkler Systems and
Foam Water Spray Systems (1995)
16A Recommended Practice for the Installation of Closed
Head Foam Water Sprinkler Systems (1994)
17 Standard for Dry Chemical Extinguishing Systems (1994)
17A Standard for Wet Chemical Extinguishing Systems (1994)
20 Standard for Centrifugal Fire Pumps (1996)
22 Standard for Water Tanks for Private Fire Protection
(1996)
24 Standard for Private Fire Service Mains and their
Appurtenances(1992)
25 Standard for the Inspection, Testing, and Maintenance
of Water Based Fire Protection Systems (1995)
69 Explosion Prevention Systems (1992)
72 National Fire Alarm Code (1996)
92A Recommended Practice for Smoke Control Systems (1996)
92B Guide for Smoke Management Systems in Mall, Atria, and
Large Areas(1991)
231 Standard for General Storage (1995)
231C Standard for Rack Storage of Materials (1995)
291 Recommended Practice for Fire Flow Testing and Marking
of Hydrants (1988)
1231 Standard on Water Supplies for Suburban and Rural
Firefighting(1995)
2001 Standard for Clean Agent Fire Extinguishing Systems
(1996)

Sec. 8. NFPA 12A is amended by the addition of: Halon systems are not
permitted to be installed as required protection in accordance
with state and/or local building or fire codes due to the
environmental impact of discharge testing, the lack of adequate
alternative test methods, and availability of alternative agents
such as carbon dioxide.

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- Sec. 9.** NFPA 13, paragraphs 4-14.1.1 and 4-15.1.1 are amended by the addition of the following: When a sprinkler system serves more than one level, each level must be consistently and separately valved by a listed and approved control valve. In addition, where a sprinkler system is required to activate a local building fire alarm system, the sprinkler system must have a separate and distinct water flow detecting device for each floor and zone.
- (a) Exception No. 1: In buildings not exceeding three floors and 3000 square feet per floor.
 - (b) Exception No. 2: Unoccupied and unused attics may be zoned with the level below.
 - (c) Exception No. 3: Mezzanines not exceeding 3000 square feet in area.
 - (d) Exception No. 4: Detention and correctional facilities.
- Sec. 10.** NFPA 13, paragraph 4-4.5.1 is amended by the addition of: Listed residential sprinkler heads must be used in dwelling units of any new occupancy or new building in which sprinkler protection is to be installed except Detention and Correctional occupancies.
- Sec. 11.** NFPA 13, is amended by the addition of paragraph 4-13.7 as follows: Sprinklers are required in attached balconies or porches unless at least 50 percent of the longest exterior side is open to the atmosphere.
- Sec. 12.** NFPA 13, the exception to paragraph 4-13.8.1 is amended as follows: Sprinklers are required in the bathrooms of any health care occupancy and in bathrooms opening directly onto public corridors or exitways.
- Sec. 13.** NFPA 13, paragraph 4-13.10 (protection of electrical equipment rooms) is amended by the deletion of the exception in its entirety.
- Sec. 14.** NFPA 13, paragraph 4-13.18.1 is amended as follows: In new installations expected to supply sprinklers below a ceiling and in any speculative areas subject to tenant changes, minimum one inch sprinkler outlets must be provided.

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Sec. 15. NFPA 13, paragraph 4-15.2 is amended by the addition of the following requirements for fire department connections:

- (a) Must be located within 100 feet from a free standing (not wall type) hydrant.
- (b) Number of 2 1/2 in. inlets:

<u>System Demand (gpm)</u>	<u>No. of Inlets</u>
up to 749	2
750-999	3
1000 and above	4

- (c) Multiple connections for the same building must be interconnected.
- (d) When a section of a building is fed by a connection (i.e., partial systems), permanent all weather identification signs must be provided on connections.
- (e) Must be sized at least as large as the main sprinkler system riser pipe or the fire pump discharge line, whichever is larger.

Sec. 16. NFPA 13, paragraph 5-1 is amended by the addition of:
Calculations for new systems or new portions of systems must meet the criteria below.

- (a) Highest hazard and most demanding use allowed by building construction permit or property zoning.
- (b) Storage use: storage height which produces the greatest demand.
- (c) Laboratory use: ordinary group 2 for class A,B, or C labs.
- (d) All uses: 20% safety factor. For systems without a pump, this is based on the demand pressure only at the supply point. For systems with a pump, this is based on both the demand pressure and demand flow at the pump discharge.

Exception to safety factor only: Owner occupied buildings can have lower safety factor if a pump would be necessary to achieve the 20%. All design options, except grids, must be explored.

Sec. 17. NFPA 13, paragraph 7-1.1 is amended by the addition of the following: Pressure and volume availability as determined by a public utility must be used for new taps. Pressure and volume availability for existing taps must be determined by an interior flow test. In any case, the supply information must be corrected for the low hydraulic gradient. Booster pumps and pump/tank supplies must only be used where it is demonstrated that the public water supply is inadequate.

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Sec. 18. NFPA 13D, paragraph 1-1 is amended by the addition of the following: This standard also applies to Day care homes containing 12 clients or less if located within converted one and two family dwellings or townhouses.

Sec. 19. NFPA 13D, paragraph 2-1 is amended by the addition of the following: Pressure and volume availability as determined by a public utility must be used and must be adjusted to the low hydraulic gradient. Booster pumps and pump/tank supplies may only be used where it is demonstrated that the public water supply is inadequate as determined by the director.

Sec. 20. NFPA 13D, exception no. 1 to paragraph 3-1.1 is amended to apply only to systems fed by a tank.

Sec. 21. NFPA 13D, paragraph 4-1.2 is amended by the addition of the following: The number of design sprinklers shall be at least three under ceilings which are not flat, smooth, and level, unless specifically listed with a two sprinkler design area.

Sec. 22. NFPA 13D, paragraph 4-2.3 is amended as follows:
Obstructions:

- (a) Sprinklers must be positioned so that response time and discharge are not adversely affected by features such as sloped ceilings, beams, lights, and permanently installed fans.
- (b) Unprotected bulkheads or soffits behind the spray of sidewall sprinklers must not exceed 8 inches in width.
- (c) Sprinkler heads in closets must not be located directly above shelves.

Sec. 23. NFPA 13D, paragraph 4-4 is amended by the addition of the following: All calculations must include at least a 10% safety factor to account for minor field changes.

Exception: If a booster pump would become necessary to obtain this safety factor.

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Sec. 24. NFPA 13R, paragraph 1-3 is amended by changing the definition of residential occupancies to those meeting one of the following, as defined in NFPA 101 "Life Safety Code":

- (a) Apartment buildings, lodging and rooming houses with either:
 - (1) A single required exit or,
 - (2) Two or more required exits, if the exits and exit access are exterior, or the exits are within 70 feet of each other, measured along the exit access path. Exterior is defined as having at least 50% of one exterior wall open to the atmosphere at each level.
- (b) Board and care facilities; slow and prompt evacuation types with nine to sixteen occupants.
- (c) Day care centers containing more than 12 clients if located within converted one and two-family dwellings or townhouses.
- (d) Lodging and rooming houses.

Sec. 25. NFPA 13R, paragraph 2-3.2 is amended by the addition of the following: Pressure and volume availability as determined by a public utility must be used, when required by the director, and must be adjusted to the low hydraulic gradient. Booster pumps and pump/tank supplies may only be used where it is demonstrated that the public water supply is inadequate.

Sec. 26. NFPA 13R, paragraph 2-4.2 is amended as follows: In all apartment buildings, a single 2 1/2 in. fire department connection with a feed line sized at least as large as the main system riser must be provided when the system has 20 or more sprinklers.

Sec. 27. NFPA 13R, exception no. 2 under paragraph 2-4.5.1 is deleted and replaced by the following: Dry type sprinklers must be used in areas which are not heated to at least 40 degrees F. Also, the exception to paragraph 2-5.1.1 is deleted.

Sec. 28. NFPA 13R, paragraph 2-5.1.2.1 is amended by the addition of the following: The number of design sprinklers shall be at least five under ceilings which are not flat, smooth and level unless specifically listed with a four sprinkler design area.

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Sec. 29. NFPA 13R, paragraph 2-5.1.7.3 is amended as follows:
Obstructions:

- (a) Sprinklers must be positioned so that response time and discharge are not adversely affected by features such as sloped ceilings, beams, lights, and permanently installed fans.
- (b) Unprotected bulkheads or soffits behind the spray of side wall sprinklers must not exceed 8 inches in width.
- (c) Sprinkler heads in closets must not be located directly above shelves.

Sec. 30. NFPA 13R, paragraph 2-5.3 is amended by the addition of the following: All calculations must include at least a 10% safety factor to account for minor field changes.

Exception: If a booster pump would become necessary to obtain this safety factor.

Sec. 31. NFPA 14, paragraph 2-8 is amended as follows: Each fire hose valve shall be provided with 2 1/2 in. valved hose connections, 2 1/2 in. to 1 1/2 in. reducers, caps, and chains.

Sec. 32. NFPA 14, paragraph 3-2 is amended as follows: Systems shall be automatic wet type.

- (a) Exception No. 1: Standpipe systems in unheated areas shall be automatic dry type.
- (b) Exception No. 2: Standpipe systems in detached open parking garages may be the manual dry type, if the piping is air supervised for breaks or open valves.

Sec. 33. NFPA 14, paragraph 3-3.2 is amended by the addition of the following:

- (a) Occupant use hose is prohibited in new or existing buildings.
- (b) New Standpipe systems shall be Class I only.

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Sec. 34. NFPA 14, paragraph 4-3 (Fire Department Connections) is amended by the addition of the following:

- (a) Must be located within 100 feet from a free standing (not wall type) hydrant.
- (b) Number of 2 1/2 in. inlets:

<u>System Demand (gpm)</u>	<u>No. of Inlets</u>
up to 749	2
750-999	3
1,000 and above	4
- (c) Multiple connections on the same building must be interconnected.
- (d) When a section of a building is fed by a connection (i.e., partial systems), permanent all weather identification signs must be provided on connections.

Sec. 35. NFPA 14, paragraph 5-3.2(f) is amended by the addition of the following:

- (a) Measurement must be parallel or at right angles to walls.
- (b) Supplemental hose valves outside the stairs must not be located within tenant spaces, unless hose reach requirements cannot be met by placement of valves in public corridors or by use of wall hydrants for spaces opening to the exterior. Hose valve locations must be marked by the placement of signs, the striping of columns, or other approved methods.

Sec. 36. NFPA 14, paragraph 5-7a is amended by the deletion of the exception given and the addition of exceptions as follows:

- (a) Exception No. 1: In high-rise buildings, where booster pumps are necessary to produce the required residual

pressures, pumps and piping systems must be sized to provide for the demand of the hydraulically most remote hose station, or the sprinkler system demand, whichever is greater. The standpipe system must also be sized to provide the required flow and pressure for all hose stations required to be flowing, when supplied by 150 psi at the fire department connection(s). Two sets of calculations will, therefore, be required under this Exception.

- (b) Exception No. 2: Systems in buildings that are not high-rise, and dry systems with no automatic water supply, may be sized to obtain the required flows and pressures, when supplied by 150 psi at the fire department connection(s).
- (c) Exception No. 3: In existing buildings, after shell occupancy, hose valves added to correct reach violations created by tenant modifications may be supplied by 3 inch pipe without recalculation.

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Sec. 37. NFPA 72, paragraph 1-5-7-1 is amended by the addition of the following: an annunciator with the following features is required when the building is greater than one story, over 20,000 square feet in area per floor, or has more than one type of alarm initiating device.

Exception No. 1: Apartments protected by a 13R sprinkler system.

Exception No. 2: Any building not exceeding two stories above grade and 3,000 square feet per floor.

- (a) Annunciator must have a visible signal for each different floor, zone, and device type. Supervised computer screen or printer type annunciators may be used to meet this requirement if the zone identification is approved by the director.
- (b) Zones must not exceed a single floor, 20,000 square feet, or 300 linear feet. Sprinkler systems may be zoned in accordance with the applicable sprinkler standard.
- (c) If two or more zones per floor are required, provide a graphic outline on or adjacent to the annunciator showing the building outline, zone boundaries, "you are here" notation, north compass arrow, all stairways, stairway identification numbers, all standpipe risers, elevators, and the building address.
- (d) A lamp type annunciator must have a lamp test switch unless the annunciator circuits are supervised.
- (e) The annunciator must be located at, and visible from, the main fire department entrance.

- (f) If two or more buildings are controlled by one alarm system, an annunciator must be installed in each building with a pilot lamp indicating the building of alarm origination.

Sec. 38. NFPA 72 paragraph 2-2.1.1 is amended by the addition of the following:

- (a) Smoke detectors must be arranged such that smoke from areas other than bathrooms or clothes/linen closets cannot bypass the detector before spreading to any sleeping room or area.
- (b) Separate entrances to sleeping rooms must be protected separately unless the doors lead only to bathroom or clothes/linen closets.
- (c) Enclosed rooms such as dens, libraries, studies, or sitting rooms which could be used as permanent or temporary sleeping areas must be treated as bedrooms.

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Sec. 39. NFPA 72, paragraph 3-12.8.9 is amended as follows: At least six handsets shall be provided in the fire control room.

Sec. 40. NFPA 72, paragraph 5-3.4.1 is amended as follows:
Detectors which activate required extinguishing systems on a cross-zoned or multiple-zone basis must be spaced at a maximum of one-half of their allowed or listed square footage spacing.

Sec. 41. NFPA 72, paragraph 5-3.4 is amended as follows: Activation of duct smoke detectors must sound an audible alarm in a normally occupied area or through the building fire alarm system, and must be identified as duct detector trouble. If connected to the building alarm, the signal must be supervisory only and must not initiate the building evacuation alarm unless a confirmation or verification feature is provided to minimize unwanted alarms

Sec. 42. NFPA 72, paragraph 5-3.6.1.2 is amended as follows: Detectors located at the top of shafts and stairs must be on a supervisory circuit only unless a confirmation or verification feature is provided to minimize unwanted alarms. The location must be identified at the annunciator or fire alarm control panel.

Sec. 43. NFPA 72, paragraph 5-6.2 is amended by the addition of the following: Standpipe or main water flow indicators, if provided, must sound a supervisory signal only.

Sec. 44. NFPA 72, the second sentence under paragraph 5-8.1.1 is changed to

read "The center of each station must be between 42 and 48 inches above the floor level." Also, this paragraph shall be amended by the addition of the following: Approved "911" instruction signs must be permanently affixed and maintained at each manual fire alarm station, unless the fire alarm is monitored by a UL listed central station.

Sec. 45. Severability. If a court of final appeal holds that any part of this regulation is invalid, that ruling does not affect the validity of other parts of the regulation.

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Sec. 46. Effective Date. A regulation adopted under Method 2 becomes effective when the Council adopts a resolution approving it, or on a later date specified in the regulation. If the Council takes no action within sixty calendar days after receipt, or by any later deadline set by resolution, the regulation is effective the day after the deadline for approval, or on a later date specified in the regulation.

Approved,

Douglas M. Duncan

County Executive